

Review 1

1. What is the velocity of section A in m/s?

$$vel = slope = \frac{rise}{run} = \frac{40m}{2} = 20m/s$$

2. What is the velocity of section C in m/s?

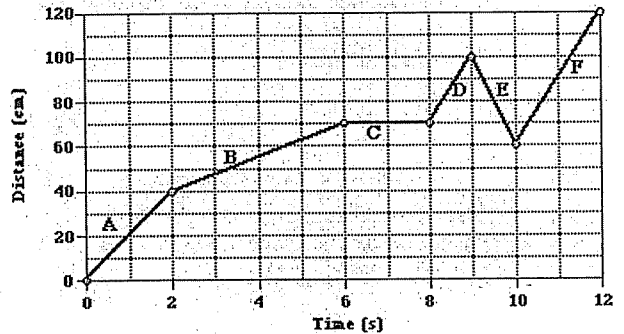
$$0 m/s$$

3. What is the velocity of section E in m/s?

$$\frac{rise}{run} = \frac{-40m}{1s} = -40m/s$$

4. What is the velocity of section F in m/s?

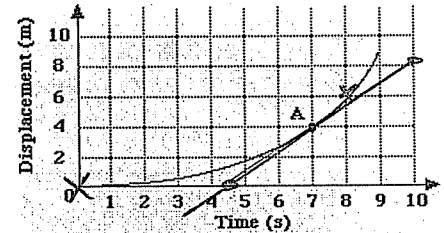
$$\frac{60m}{2} = 30m/s$$



5. Examine the following graph and answer the questions.

(a) Find the instantaneous velocity at point A. - tangent so approx.

$$Velocity = slope = \frac{8.2m}{5.5s} = 1.49m/s$$



(b) What is the average velocity for the first 8.0 seconds of the trip?

$$slope \text{ between 2 points} = \frac{6m}{8s} = .75m/s$$

6. A ball thrown straight up into the air reaches its highest point when its velocity and acceleration are equal to :

- a) velocity = + 9.8 m/s acceleration = 0 m/s²
- b) velocity = 0 m/s acceleration = 0 m/s²
- c) velocity = 0 m/s acceleration = - 9.8 m/s²
- d) velocity = 0 m/s acceleration = + 9.8 m/s²

= 0 -9.8 m/s²
always

7. If you throw a ball upwards at 6.0 m/s how fast will the ball be moving when it returns to your hand (just before you catch it). Ignore air resistance?

6.0 m/s downward.

8. A traveler drives 568 km in 7.2 h. What is the average speed for the trip?

$$v = \frac{d}{t} = \frac{568km}{7.2 Hr} = 79 km/Hr$$

9. If you run with an average speed of 12.0 km/h, how far will you go in 3.2 min? *60 = 192 s

$$12.0 km/Hr \div 3.6 = 3.33 m/s$$

$$d = v \cdot t = (3.33 m/s)(192 s) = 640m$$

10. If the average speed of your private jet is 8.0×10^2 km/h, how long will it take you to travel 1.8×10^3 km?

$$v = \frac{d}{t}, t = \frac{d}{v} = \frac{1.8 \times 10^3 km}{8 \times 10^2 km/Hr} = 2.25 Hr$$

11. Light travels with a speed of 3.00×10^5 km/s. How long will it take light from a laser to travel to the moon (where it is reflected by a mirror) and back to Earth? The moon is 3.84×10^5 km away from the Earth.

$$v = \frac{d}{t}, \quad t = \frac{d}{v} = \frac{2(3.84 \times 10^5 \text{ km})}{3 \times 10^5 \text{ km/s}} = 2.56 \text{ s}$$

return distance

12. A skier accelerates at 1.20 m/s^2 down an icy slope, starting from rest. How far does he get in 5.0 s?

$$v_0 = 0 \text{ m/s} \quad d = ? \quad d = v_0 t + \frac{1}{2} a t^2$$

$$a = 1.2 \text{ m/s}^2 \quad = 0 + \frac{1}{2} (1.2) (5)^2 = 15 \text{ m}$$

$$t = 5.0 \text{ s}$$

13. What is the acceleration of an object that accelerates steadily from rest, traveling 10.0 m in 10.0 s?

$$a = ? \quad t = 10 \text{ s} \quad d = v_0 t + \frac{1}{2} a t^2 \quad 10 = 50a$$

$$v_0 = 0 \quad 10 = 0 + \frac{1}{2} a (10)^2 \quad a = \frac{10}{50} = .2 \text{ m/s}^2$$

$$d = 10 \text{ m}$$

14. How long does it take an airplane, accelerating from rest at 5.00 m/s^2 , to travel 360 m?

$$t = ? \quad d = 360 \text{ m} \quad d = v_0 t + \frac{1}{2} a t^2 \quad t^2 = 144$$

$$v_0 = 0 \quad 360 \text{ m} = 0 + \frac{1}{2} (5) (t^2) \quad t = 12 \text{ s}$$

$$a = 5.0 \text{ m/s}^2 \quad 360 = 2.5 t^2$$

15. A jet plane lands with a velocity of 115 m/s and can accelerate at a maximum rate of -5.25 m/s^2 as it comes to rest. From the instant it touches the runway, what is the **minimum time** needed before it comes to rest?

$$v_0 = 115 \quad t = ? \quad v_f = v_0 + a t \quad t = 21.9 \text{ s}$$

$$v_f = 0 \quad 0 = 115 + (-5.25) t$$

$$a = -5.25 \text{ m/s}^2 \quad -115 = -5.25 t$$

16. A car enters a tunnel at 24 m/s and accelerates steadily at 2.0 m/s^2 . At what speed does it leave the tunnel, 8.0 s later?

$$v_0 = 24 \text{ m/s} \quad v_f = ? \quad v_f = v_0 + a t$$

$$a = 2.0 \text{ m/s}^2 \quad = 24 + (2)(8)$$

$$t = 8.0 \text{ s} \quad = 40 \text{ m/s}$$

17. A runner accelerates uniformly from rest at 1.40 m/s^2 for 8.00 s.

What is her final velocity? $v_f = v_0 + a t$

$$= 0 + (1.4)(8) = 11.2 \text{ m/s}$$

What is her average velocity? $\frac{v_0 + v_f}{2} = \frac{0 + 11.2}{2} = 5.6 \text{ m/s}$

How far does she travel? $d = v_0 t + \frac{1}{2} a t^2$

$$= 0 + \frac{1}{2} (1.4) (8)^2 = 44.8 \text{ m}$$

18. A rock is dropped from the 100th floor of a tall building (350 m above the ground). How long does it take to fall to the ground below and with what speed will it hit the ground at?

$$d = 350 \text{ m} \quad v_f^2 = v_0^2 + 2ad \quad v_f = v_0 + a t$$

$$a = 9.8 \text{ m/s}^2 \quad v_f^2 = 0 + 2(9.8)(350) \quad 83 = 0 + (9.8)t$$

$$v_0 = 0 \text{ m/s} \quad v_f = 83 \text{ m/s} \quad t = 8.45 \text{ s}$$

19. A ball is thrown straight upwards and reaches a maximum height of 95 m. With what initial velocity was it thrown? $v_f = 0$

$$v_0 = ? \quad d = 95 \text{ m} \quad v_f^2 = v_0^2 + 2ad \quad v_0^2 = 1862$$

$$v_f = 0 \quad 0 = v_0^2 + 2(-9.8)(95 \text{ m}) \quad v_0 = 43.2 \text{ m/s}$$

$$a = -9.8 \text{ m/s}^2 \quad 0 = v_0^2 - 1862$$

20. A baseball is thrown straight upwards at 28.0 m/s.

a) To what maximum height will it reach?

$$v_0 = 28 \quad d = ? \quad v_f^2 = v_0^2 + 2ad$$

$$v_f = 0 \quad 0 = 28^2 + 2(-9.8)d$$

$$a = -9.8 \text{ m/s}^2 \quad 0 = 784 - 19.6d$$

b) How long will it remain in the air (from being thrown upwards to being caught)? $19.6d = 784$

$$v_0 = 28 \text{ m/s} \quad t = ? \quad v_f = v_0 + at \quad -56 = -9.8t \quad d = 40 \text{ m}$$

$$v_f = -28 \text{ m/s} \quad -28 = 28 - 9.8t \quad t = 5.7 \text{ s}$$

How many significant digits do each of the following have?

21. 103,450 $\overset{\vee\vee\vee\vee\vee}{}$ 5

22. 0.0250 $\overset{\times\times\vee\vee\vee}{}$ 3

Write each of the following in scientific notation:

23. 0.0832 8.32×10^{-2}

24. 64,200 6.42×10^4

25. How many seconds are in 24 weeks? $24 \text{ weeks} \left(\frac{7 \text{ days}}{\text{week}} \right) \left(\frac{24 \text{ hrs}}{\text{day}} \right) \left(\frac{3600 \text{ s}}{\text{hr}} \right) = 1.45 \times 10^7 \text{ s}$

26. How many kilograms are there in 132 pounds? There are 2.2 pounds in 1 kilogram.

$$132 \text{ pounds} \left(\frac{1 \text{ kg}}{2.2 \text{ pounds}} \right) = 60 \text{ kg}$$

Answers:

1. 0.20 m/s
2. 0 m/s
3. -0.4 m/s
4. 0.30 m/s
5. 1.5 m/s, 0.75 m/s
6. C
7. -6.0 m/s
8. 79 km/h
9. 0.64 km

10. 2.3 h
11. 2.56 s
12. 15 m
13. 0.20 m/s²
14. 12 ~~m/s~~ S
15. 21.9 s
16. 40. m/s
17. 11.2 m/s, 5.6 m/s, 44.8 m
18. 8.45 s; 83 m/s

19. 43.2 m/s
20. 40 m, 5.7 s
21. 5
22. 3
23. 8.32×10^{-2}
24. 6.42×10^4
25. 1.45×10^7
26. 60 kg

11
C

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data.

In the second section, the author outlines the various methods used to collect and analyze the data. This includes both manual data entry and the use of specialized software tools. The goal is to ensure that the data is both accurate and easy to interpret.

The third part of the document provides a detailed breakdown of the results. It shows that there is a clear trend in the data, which is consistent with the initial hypothesis. This finding is significant as it provides strong evidence for the proposed model.

Finally, the document concludes with a summary of the key findings and a list of recommendations for future research. It suggests that further studies should be conducted to explore the underlying causes of the observed trends and to test the model under different conditions.

C

The following table summarizes the key data points from the study. It shows the relationship between the independent variables and the dependent variable, highlighting the most significant correlations.

Variable	Value
Variable A	12.5
Variable B	8.7
Variable C	15.2
Variable D	9.1
Variable E	11.8

The data indicates that Variable C has the highest value, while Variable B has the lowest. This suggests that Variable C is the most influential factor in the study.

The analysis also shows that there is a strong positive correlation between Variable A and Variable C. This means that as Variable A increases, Variable C also tends to increase.

C

The final section of the document discusses the implications of the findings. It suggests that the results have important implications for the field of study and could be used to inform policy decisions.

The author also acknowledges the limitations of the study and provides suggestions for how these limitations can be addressed in future research. This includes the need for larger sample sizes and more diverse data sources.

In conclusion, the study has provided valuable insights into the relationship between the variables and has identified key areas for further research. The findings are both significant and actionable, and they provide a solid foundation for future work in this area.